

WHAT IS CLAIMED IS:

1. 1. A method for making a field emitter device comprising the steps of:
2. providing a substrate;
3. treating said substrate to modify a morphology of said substrate; and
4. growing a carbon film on said treated substrate.

1. 2. The method as recited in claim 1, wherein only a portion of said substrate
2. is subjected to said treating step, and wherein said carbon film grown on said
3. treated substrate is a better field emitter than carbon film grown on an untreated
4. portion of said substrate.

1. 3. The method as recited in claim 2, wherein said carbon film grown on said
2. treated portion of said substrate emits substantially more electrons when subjected
3. to a specified electric field than said carbon film on said untreated substrate.

1. 4. The method as recited in claim 1, wherein said substrate is treated with a
2. base, wherein said treating step changes the chemical composition of said surface
3. of said substrate.

1. 5. The method as recited in claim 1, wherein said substrate is treated with an
2. acid.

1 6. The method as recited in claim 5, wherein said substrate is a ceramic.

1 7. The method as recited in claim 5, wherein said substrate is a metal.

1 8. The method as recited in claim 5, wherein said substrate is a glass.

1 9. The method as recited in claim 1, further comprising the step of performing
2 sonication on said substrate.

1 10. The method as recited in claim 3, wherein said substrate was not subjected
2 to a sonication step.

1 11. The method as recited in claim 1, further comprising the steps of:
2 depositing a metal layer on said substrate whereby said metal layer has a
3 predefined pattern so that a portion of said substrate is accessible through said
4 metal layer, wherein said depositing step is performed before said growing step.

1 12. The method as recited in claim 11, wherein said step of growing said
2 carbon film also deposits said carbon film on said metal layer, wherein said carbon
3 film is a continuous film.

1 13. The method as recited in claim 11, wherein said step of depositing said
2 metal layer on said substrate further comprises the steps of:
3 depositing said metal layer on said substrate;
4 patterning said metal layer using photolithography; and
5 etching said metal layer producing said predefined pattern.

1 14. A field emitter device manufactured by the following steps:
2 providing a substrate;
3 treating said substrate to modify a morphology of said substrate; and
4 growing a carbon film on said treated substrate, wherein only a portion of
5 said substrate is subjected to said treating step, and wherein said carbon film
6 grown on said treated substrate is a better field emitter than carbon film grown on
7 an untreated portion of said substrate, wherein said carbon film grown on said
8 treated portion of said substrate emits substantially more electrons when subjected
9 to a specified electric field than said carbon film on said untreated substrate.

1 15. The device as recited in claim 14, wherein said substrate is treated with an
2 acid.

1 16. The device as recited in claim 15, wherein said substrate is a ceramic.

1 17. A method for depositing a carbon film comprising the steps of:
2 depositing a metal layer on a substrate whereby said metal layer has a
3 predefined pattern so that a portion of said substrate is accessible through said
4 metal layer; and
5 depositing said carbon film on said portion of said substrate.

1 18. The method as recited in claim 17, wherein said step of depositing said
2 carbon film also deposits said carbon film on said metal layer.

1 19. The method as recited in claim 18, wherein said carbon film is a continuous
2 film.

1 20. The method as recited in claim 17, wherein said step of depositing said
2 metal layer on said substrate further comprises the steps of:
3 depositing said metal layer on said substrate;
4 patterning said metal layer using photolithography; and
5 etching said metal layer producing said predefined pattern.

1 21. The method as recited in claim 20, wherein said etching step roughens a
2 surface of said substrate at said portion of said substrate.

1 22. The method as recited in claim 21, wherein said substrate is a ceramic-like
2 material.

1 23. The method as recited in claim 17, wherein said step of depositing said
2 metal layer on said substrate further comprises the steps of:

3 etching said substrate, wherein said etching step changes the chemical
4 composition of said surface of said portion of said substrate; and
5 depositing said metal layer on said substrate through a mask producing said
6 predefined pattern.

1 24. The method as recited in claim 23, wherein said etching step roughens a
2 surface of said substrate.

1 25. The method as recited in claim 20, wherein said etching step changes the
2 chemical composition of said surface of said portion of said substrate.

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